Original Paper

A Laser Watch for Simultaneous Laser Blood Irradiation and Laser Acupuncture at the Wrist

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Key Words

Laser · Watch · Laser acupuncture · Laser blood irradiation

Abstract

Background: Laser medicine in general has experienced enormous progress over the last years. The latest innovation is a so-called laser watch, a system only slightly larger than a wrist watch. **Methods:** The laser watch is applied to the wrist, where simultaneous and continuous acupuncture point or blood irradiation using laser light can be performed. **Results:** This results in new and promising therapeutic approaches for different diseases. This article introduces and briefly discusses the first pilot measurements with regard to the laser watch. **Conclusion:** The laser watch is practicable; however, further research is absolutely necessary before the laser watch is widely used.

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Introduction

In the field of medicine, it has always been attempted to combine different methods and procedures for the benefit of patients in order to achieve improvements with regard to diagnostic and therapeutic possibilities. The miniaturisation and practicability of individual systems and system components therefore also plays a large role. A very good example of this is the new laser watch [1], which on the one hand applies laser acupuncture [2] and laser blood irradiation [2] in the area of the wrist in parallel, and on the other hand represents a piece of practicable and appropriately-dimensioned equipment.

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Fig. 1. Laser watch for laser acupuncture and laser blood irradiation. **a** Front. **b** Rear. **c** View with the nasal adapter.

It should be mentioned that there are many different ‘laser watch’ systems currently available which are mainly produced in Asia. However, according to the authors’ current state of knowledge, the quantifiable effects of the stimulation methods (laser acupuncture and laser blood irradiation) have never been recorded. Within this article, an innovative laser watch (which is produced in China and available in Germany from Weber Medical) is presented for the first time together with initial scientific data.

Methods, Technical Aspects and Possible Indications

The technical data of the laser watch are listed below. The laser consists of a GaA/As semiconductor and operates at a wavelength of 650 nm. The laser installed in the watch comprises 10 individual laser beams for the wrist and an additional adapter for nasal stimulation. The output power is 5 mW, but it can also be adjusted. The device operates at an ambient temperature of -20 to $+40^{\circ}\text{C}$ and a relative humidity of $\leq 85\%$. The atmospheric pressure should be between 86 and 106 kPa. The laser watch can be used for a variable irradiation period of 10–60 min (fig. 1) [3, 4].

The features of the device are as follows: energy-saving, processed in light-weight carbon, environmentally friendly and easy-to-use operation. Furthermore, the low energy consumption and long-lasting performance of the device is praised. The device has a colour LCD. The small size and therefore low weight are positive features, meaning that the device can also be easily transported [3, 4].

According to a website which advertises this product, the laser watch is not suitable for cancer patients, pregnant women or people with haemorrhagic diseases. Children should only use the watch under supervision by an adult. It is recommended that elderly and sensitive people perform the therapy at first at low power and for a short period of time. The strength and duration can then be individually increased or extended according to the body’s reaction [3, 4].

According to the quoted sources, the laser watch is, amongst other things, suitable in case of hypertension and diabetes mellitus. Furthermore, the laser watch is intended to serve for the treatment of cerebral thromboses and strokes as well as for the prevention of sudden cardiac arrest. It should also be used in the field of pain medicine. General pain conditions as well as sports injuries, wounds, broken bones, arthritis and joint pain should be treated using the laser watch. In addition to this, according to the stated sources, the laser watch can be used with the nasal stimulator (fig. 1c) for different forms of rhinitis (allergic, acute, chronic) and also for sinusitis or in case of nasal polyps. According to the manufacturer, hyperviscosity syndrome, hyperlipidaemia, hypertension and various cardiovascular and cerebrovascular diseases are further indications for its use [3, 4].

Fig. 2. Laser blood irradiation using the laser watch.

As already mentioned, the laser watch irradiates defined acupuncture points on the wrist. In this process, the laser penetrates the vessel walls with a wavelength of 650 nm. The tissue under the laser watch absorbs the energy of the laser in order to produce lipoprotein lipase. Subsequently, the microcirculation and the oxygen transportation capacity of the red blood cells are improved. As a result, the blood is cleaned, and insulin secretion can, according to the manufacturer's information, attain a normal level once more [3, 4].

As already mentioned, the laser watch can also irradiate the inner area of the nose using the adapter included. The inner area of the nose comprises a multitude of capillaries. The nerves in the nose are stimulated, the blood circulation in the skull is improved and in total the local microcirculation is thus improved. Furthermore, as a result of the stimulation, more oxygen should be made available to the brain [3, 4].

The main function of the laser watch is the irradiation of the radial artery, the ulnar artery (fig. 2), the Neiguan acupuncture point and further acupuncture points (fig. 3). Therefore, simultaneous irradiation of important regions of the body can be provided. The device includes an automatic switch-off function in order to ensure that the precise stimulation time is observed. It has been constructed in a shape especially adapted to the human wrist in order to guarantee a perfect fit.

Several devices have two output modes (pulsating and continuous) [6]. However, the manufacturer also states several warnings regarding handling of the laser watch [6]. Looking directly into the laser beam is, of course, to be avoided. Likewise, handling the active laser watch without the corresponding protection equipment (glasses) is also hazardous. According to the manufacturer's data, use of the laser watch is prohibited for patients with a cardiac pacemaker for reasons unknown [6].

Current Scientific Research regarding the Laser Watch

In pilot trials of our research group, it could be shown that total heart rate variability (HRV) increases temporarily during stimulation with the laser watch in healthy volunteers (fig. 4). However, after completion of the 20-min stimulation, the HRV returned again to the initial level.

If the data of this study are compared to those of previous ones, in which red laser, amongst others, was also used at a similar wavelength (658 nm) at the Neiguan point, it

Fig. 3. Acupuncture points stimulated by the laser watch (modified from Bahr et al. [5]).

Fig. 4. HRV during laser watch stimulation. An increase in the frequency band 0.05–0.15 Hz (arrow) can be observed, in which effects on the blood pressure control system, amongst other things, manifest themselves during the optical stimulation. X-axis: time; Y-axis: frequency.

Fig. 5. Improved microcirculation (15% increase) during a 20-min laser stimulation applied through the laser watch. Simultaneously, a temperature increase in the area of the fingertip of the index finger can be observed.

should be mentioned that HRV did not increase significantly under red laser stimulation in the initial study. The effect of the increase of HRV during irradiation with the laser watch is possibly attributable to the simultaneous stimulation of both the Neiguan acupuncture point (and other points) as well as the radial artery, having a summation effect on the HRV [7].

According to the manufacturer, a further important point is the improved microcirculation which can be generated by the laser watch. Numerous publications already exist which describe the verified improvement of microcirculation when using yellow lasers, for example [8]. Such basic research must, of course, also be performed with the laser watch, which operates using red laser light. Initial indications of an improvement in microcirculation resulting from the laser watch have been documented (fig. 5), but large-scale studies are still lacking.

Besides the optical irradiation of the popliteal area [9], through which Campbell and Murphy were initially able to determine a shift of biological rhythms via body temperature and melatonin concentration [10], laser blood irradiation and laser acupuncture by means of a 'watch' in the area of the wrist provide a non-invasive, practicable method. The use of the laser watch appears to generate physiological effects. The scientific verification of the method is currently being undertaken, but only in part, meaning that a significant need for research still exists.

Tradition and Innovation

The laser watch is a very good example of integrative medicine. It comprises different forms of stimulation (laser acupuncture and laser blood irradiation). It was developed on the background of traditional Chinese medicine, but using modern electronic and optical tech-

niques. It represents an optical stimulation of traditional acupuncture points by non-thermal laser irradiation. We are sure that this kind of method will be widely accepted in integrative medicine, e.g. by patients with needle phobia. It is also suitable for patients with poor immune function or bleeding diseases as well as for practitioners who are not acupuncturists. As stated by Pan and Zhou [11, 12], integrative medicine is a means of combining any effective method or treatment from complementary and alternative medicine or traditional medicines and Western medicine in order to establish new, complex ways to effectively treat, diagnose or explore various complex diseases or symptoms, to avoid misdiagnoses, side effects or unilateral treatment, to improve quality of life and to prolong lives. In our opinion, the laser watch meets these criteria. The underlying traditional theory of the laser watch can be demonstrated exemplarily by means of the Neiguan acupuncture point (PC6). Stimulation of this acupuncture point has been shown to have stabilising effects on blood pressure [13] and increasing effects on microcirculation in the fingertip [14]. All this can now also be achieved by wearing the laser watch. In the future, the device is to be further investigated within a joint Sino-Austrian project in patients with lifestyle-related diseases such as burnout syndrome (traditional Chinese medicine diagnosis: qi deficiency).

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All figures were modified from Litscher and Litscher [1].

Disclosure Statement

Both authors hereby declare that no conflict of interests exists in connection with the publication of this article.

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